



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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OAR TREATMENT SYSTEM PILOTING APPROVAL

Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

Environmental Operating Solutions, Inc.
230 Jones Street
Falmouth, MA 02540

Trade name of technology and model: OAR System (Patent Pending) (hereinafter called the "System").
Schematic drawings illustrating the System are attached and are part of this Approval.

Transmittal Number: W 027313
Date of Issuance: January 7, 2003
Date of Expiration: January 7, 2008

Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection hereby issues this Approval to: Environmental Operating Solutions, Inc., 230 Jones Street, Falmouth, MA 02540 (hereinafter "the Company"), to Pilot in the Commonwealth of Massachusetts the System described herein. Sale and use of the System are conditioned on and subject to compliance by the Company and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

Signed

Glenn Haas, Director
Division of Watershed Management
Department of Environmental Protection

January 7, 2003
Date



I. Purpose

1. The purpose of this Approval is to provide field testing and technical demonstration of the System in Massachusetts, on a Pilot Approval basis, so as to evaluate that the System can function effectively.
2. With the necessary permits and approvals required by 310 CMR 15.000, this Pilot Approval authorizes the use and installation of the System in Massachusetts, and requires testing so that the Department can determine whether the System is capable of consistently functioning to effectively reduce total nitrogen (TN) to less than 19 mg/ L. TN is equal to TKN (Total Kjeldahl Nitrogen) plus NO₂ (Nitrite) plus NO₃ (Nitrate).
3. The System may be installed and operated in conformance with 310 CMR 15.285 and only on facilities that meet the criteria of 310 CMR 15.285(2).
4. This Approval for Piloting authorizes the use of the System, with the approval of the local approving authority, for upgrades of existing failed, failing or substandard systems and for new construction for systems with design flows less than 2,000 gallons per day.

II. Design Standards

1. The System is one based on the use of naturally occurring bacteria to provide improved treatment. The System consists of two tanks, an initial tank into which nutrients and a naturally occurring strain of bacteria (nitrifiers to convert nitrogen compounds to nitrite and nitrate) are added, and a second tank into which a second naturally occurring strain of bacteria (denitrifiers to convert nitrite and nitrate to nitrogen gas) and nutrients are added.
2. Compressed air is injected into the initial tank (aerobic reactor) to reduce biochemical oxygen demand (BOD₅), Total Suspended Solids (TSS) and to nitrify the ammonia and organic nitrogen in the influent. An electric heating element, thermostatically controlled, is provided to create the appropriate thermal conditions to enhance System performance. Some limited denitrification may, at times, take place in the initial tank. The effluent from the initial tank flows by gravity into the second tank (denitrification tank) where denitrification bacteria and a carbon source are added. An insulated storage container, which contains the carbon and bacteria, is located adjacent to the reaction vessels. The container may be located above or below ground or inside a nearby building or in the riser section of the unit where the riser has sufficient height. The carbon and bacteria need to be monitored on a regular basis.
3. The System shall be installed in series between the septic tank and the soil absorption system (SAS) of a standard Title 5 system constructed in accordance with 310 CMR 15.100 - 15.279, subject to the provisions of this Approval.
4. In accordance with 310 CMR 15.217(2), an increase in calculated allowable nitrogen loading per acre is allowed for facilities with the use of the System in areas subject to nitrogen loading limitations under 310 CMR 15.214. When used in such areas:
 - a. for residential facilities with a design flow less than 2,000 gallons per day (gpd), the design flow shall not exceed **660** gallons per day per acre (gpda);

- b. for non-residential facilities with a design flow less than 2,000 gpd, the design flow shall not exceed **550** gpda.

III. General Conditions

1. No more than 15 Systems may be installed under this Approval. A representative of the Company shall be present onsite to inspect and approve each System installation.
2. All provisions of 310 CMR 15.000 are applicable to the use of this System, the System owner and the Company, except those that specifically have been varied by the terms of this Approval.
3. Any required operation and maintenance shall be performed by the Company in accordance with a Department approved plan. Any required sample analysis shall be conducted by an independent U.S. EPA or DEP approved testing laboratory, or a DEP approved independent university laboratory. It is a violation of this Approval to falsify any data collected pursuant to an approved testing plan, to omit any required data or to fail to submit any report required by such plan.
4. The following table lists the monitoring requirements for Systems installed under this Approval. The following parameters shall be monitored: pH, BOD₅, TSS and TN. All monitoring data shall be submitted to the Department and local approving authority within 45 days of the sampling date.

Facility Type	Stream	Frequency	Sample Type
Residential	Effluent	Every month for the first six months, quarterly thereafter for 12 months	Grab
Non-residential	Influent* & Effluent*	Monthly for the first twelve months, quarterly thereafter	Composite*

* Unless the Department determines otherwise upon the written request of the Company.

5. The facility served by the System and the System itself shall be open to inspection and sampling by the Department and the local approving authority at all reasonable times.
6. In accordance with applicable law, the Department and/or the local approving authority may require the owner of the System to cease operation of the system and/or to take any other action as it deems necessary to protect public health, safety, welfare and the environment.
7. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sewer system. Accordingly, no System shall be installed, if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004.
8. Design and installation of the System shall be in strict conformance with the Company's DEP approved plans and specifications, 310 CMR 15.000 and this Approval.

IV. Conditions Applicable to the System Owner

1. The System is approved in connection with the discharge of sanitary wastewater only. Any non-sanitary wastewater generated or used at the facility served by the System shall not be introduced into the System and shall be lawfully disposed of.
2. All samples shall be taken at a flowing discharge point, i.e.- distribution box, pipe entering a pump chamber or other Department approved location from the treatment unit. Any required influent sample shall be taken at a point that will provide a representative sample of the influent. Influent sampling locations shall be determined by the system designer, subject to written approval by the Department.
3. Effluent discharge concentrations shall not exceed treatment standards listed in Section V, item 9.
4. Operation and Maintenance plan and agreement:
 - a. Throughout its life, the System shall be under an operation and maintenance (O&M) agreement with the Company. The first O&M agreement shall be for a term of at least 18 months. Each subsequent O&M agreement shall be for a term of at least three years;
 - b. No System shall be used until an O&M plan is submitted to the Department and the local approving authority which:
 - i Provides for the contracting with the Company to provide services consistent with the System's specifications and the operation and maintenance requirements specified by the Company and any specified by the Department;
 - ii Contains routine O&M activities specified by the Company necessary for proper operation of the System;
 - iii Contains procedures for notification to the Department and the local approving authority within five days of a System failure or alarm event and for corrective measures to be taken immediately;
 - iv Provides the name of the Company operator, which must be a Massachusetts certified operator as required by 257 CMR 2.00, that will operate and monitor the System. The Company operator must operate and sample the System at the frequency specified in Section III item 4 and anytime there is an alarm event;
 - v. Contains an agreement to monitor the System for at least the first 18 months as described in Section V, items 7 through 12.

5. After the first 18 months of operation, if the System is approved as acceptable in accordance with the provisions contained in Section V paragraph 12 by the Department, the owner shall sign at least a three-year agreement with the Company.
 - a. Effluent discharge limits shall remain as prescribed in Section V, item 9. Should the System exceed the applicable TN limit on two consecutive sampling events, the owner shall have the Company submit within 60 days a report to the Department on the reasons for the exceedances with recommendations of how future violations will be prevented.
 - b. The owner shall have the Company submit monitoring data and O & M inspection results to the Department and the local approving authority annually by September 30th for the preceding 12 months. The inspection results must be recorded on a DEP approved inspection form and a technology checklist, copies of which are attached to this Approval. The forms must be completed by the System operator.
 - c. The owner and the Company may request, in writing, a change in the monitoring requirements from the Department.
6. The owner of the System shall at all times have the System properly operated and maintained in accordance with the Company's operation and maintenance requirements and this Approval.
7. This is a proprietary system designed, supplied and operated by the Company. The owner shall notify the Department and the local approving authority in writing and submit a copy of each new agreement to operate and monitor the System within 30 days of signing that agreement.
 - a. Should the contract be terminated for any reason, the owner shall within 90 days submit an application to the local approving authority to replace the System with a fully complying Title 5 system or shall provide the Department and the local approving authority with an O&M agreement with an operator or firm that shall warrant that they can operate and maintain this System.
8. The owner shall furnish the Department any information, which the Department may request regarding the System, within 21 days of the date of receipt of that request.
9. The owner of the System shall provide a copy of this Approval, prior to the signing of a purchase and sale agreement for the facility served by the System or any portion thereof, to the proposed new owner.
10. Prior to installation of the System, the proposed owner shall submit to the Department the written approval of the local approving authority, together with a copy of the complete application submitted to the local approving authority and a complete BRP WP 64b application and obtain DEP written approval.
11. The owner shall record in the appropriate registry of deeds a Notice that discloses the existence of this Pilot Use approved alternative system and the involvement of the Department in the approval of the system. Prior to the local approving authority's issuance of a Certificate of Compliance for the system, the owner shall both record the Notice in the registry and submit to the Department and the local approving authority the book and page number of the recording. If the property subject to the Notice is unregistered land, the Notice shall be marginally referred on the owner's deed to the property. Within 30 days of recording and/or registering the Notice, the System owner shall submit the following to the Department and the local approving authority: (i) a

certified registry copy of the Notice bearing the book and page/instrument number and/or document number; and (ii) if the property is unregistered land, a Registry copy of the owner's deed to the property, bearing the marginal reference.

12. Within fourteen days of the local approving authority's issuance of the Certificate of Compliance, the owner shall submit a copy of the Certificate of Compliance to the Department.

V. Conditions Applicable to the Company

1. By January 31st of each year, the Company shall submit to the Department a report, signed by a corporate officer, general partner or Company owner, that contains information on the System, for the previous calendar year. The report shall state: the number of units of the System sold for use in Massachusetts during the previous year; the address of each installed System, the owner's name and address, the type of use (e.g. residential, commercial, institutional), and the design flow; and for all Systems installed since the date of issuance of the Approval, the status of the operation and maintenance agreement with the owner, all known failures, malfunctions, and corrective actions taken and the date and address of each such event.
2. The Company shall notify the Director of the Watershed Permitting Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval is issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.
3. The Company shall furnish the Department any information that the Department requests regarding the System, within 21 days of the date of receipt of that request.
4. The Company shall provide the Department with an intended use evaluation of the System as part of pilot application for the design of any nonresidential units to ensure that the proposed use of the System is consistent with the unit's capabilities.
5. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval a standard protocol essential for consistent and accurate measurement of installed Systems, including procedures for sample collection and analysis of the System. The protocol shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.
6. Prior to design and sale of the System, the Company shall provide the purchaser with a copy of this Approval. Prior to any contract for distribution or sale of the System, the Company shall notify the Department in writing and provide a plan to ensure that the distributor or seller shall provide the purchaser of the System, prior to any sale of the System, with a copy of this Approval.
7. The System, as described in Section II shall be provided to the owner under a Design/Build/Long term maintenance delivery program. The technology proponent shall include at least the following services under the Design/Build/Long term maintenance program:
 - a. Design of the System and furnishing of plans for local and Department approval.

- b. Furnish the physical components of the System appropriately sized for the intended use.
 - c. Manage the installer and electrical contractor.
 - d. Furnish an initial supply of carbon and bacteria.
 - e. Prior to the startup the System, meet with the owner and review and start up procedures for the System.
 - f. After the first week of operation, revisit the site to evaluate System operation.
 - g. Visit the facility monthly for six months to inspect the System and collect samples.
 - h. Visit the facility and conduct quarterly inspections for the next 12 months and furnish and replenish carbon and bacteria supplies and collect samples of the effluent.
 - i. Prepare and file a report to the Department within 45 days of each inspection and sampling period.
 - j. After the first 18 months of operation, provide the owner with the required O&M contract to ensure continuous operation of the system.
- 8. For at least the first 18 months of operation, the Company shall operate, maintain and monitor the Systems in accordance with Section III, item 4 of this Approval.
 - 9. The concentration in the effluent of BOD₅ and TSS discharged from the System shall not exceed 30 mg/L. Effluent pH shall be between 6 and 9. The TN concentration in the effluent discharged from the System shall not exceed 19 mg/ L for all systems.
 - 10. During the 18 months of operation, excluding the first three months of startup operations, if the effluent concentration from the System exceeds the applicable TN limit on two consecutive sampling events, the Company shall within 60 days submit a report to the Department explaining the reasons for the exceedances with recommendations for operational or design changes to prevent future violations.
 - 11. For at least the first 18 months of operation of each System, the Company shall be responsible for submitting monitoring data and O & M inspection results to the Department and the local approving authority within 45 days of each sampling date and each inspection date. The inspection results must be recorded on a DEP approved inspection form and a technology checklist, copies of which are attached to this Approval. Accurate completion of the forms shall be the responsibility of the Company.
 - 12. Within 30 days of the end of the first 18 months of operation the Company shall submit a summary report on each System describing the operations of the System, any changes in operation or design that were made during the Piloting period, the final results of the Piloting program for that system and whether the System met the effluent limits for the previous 12 months of operation. That report shall also include either recommendations for approving and ending the Piloting program for that System or recommendations for continuing Piloting for any System that has not performed as planned.

13. The Department will review the report in item 12 above and determine if additional Piloting of the System is required. The Company shall either continue the Piloting program for that System as required by the Department or remove the System and replace it with a fully complying Title 5 system. If the Department determines that the System has performed at the relevant level for at least 12 months, the Company can turn the responsibility for operation and monitoring of the System over to the owner in accordance with Section IV, item 4 of this Approval.
14. If the Company wishes to continue this Piloting Approval after its expiration date, the Company shall apply for and obtain a renewal of this Approval. The Company shall submit a renewal application at least 180 days before the expiration date of this Approval, unless permission for a later date has been granted in writing by the Department.

VI. Reporting

1. All notices and documents required to be submitted to the Department by this Approval shall be submitted to:

Director
Watershed Permitting Program
Department of Environmental Protection
One Winter Street - 6th floor
Boston, Massachusetts 02108

VII. Rights of the Department

1. The Department may suspend, modify or revoke this Approval for cause, including, but not limited to, non-compliance with the terms of this Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to this Approval and/or the System against the owner, or operator of the System and/or the Company.

VIII. Expiration date

1. Notwithstanding the expiration date of this Approval, any System sold and installed prior to the expiration date of this Approval, and approved, installed and maintained in compliance with this Approval (as it may be modified) and 310 CMR 15.000, may remain in use unless the Department, the local approving authority, or a court requires the System to be modified or removed, or requires discharges to the System to cease.